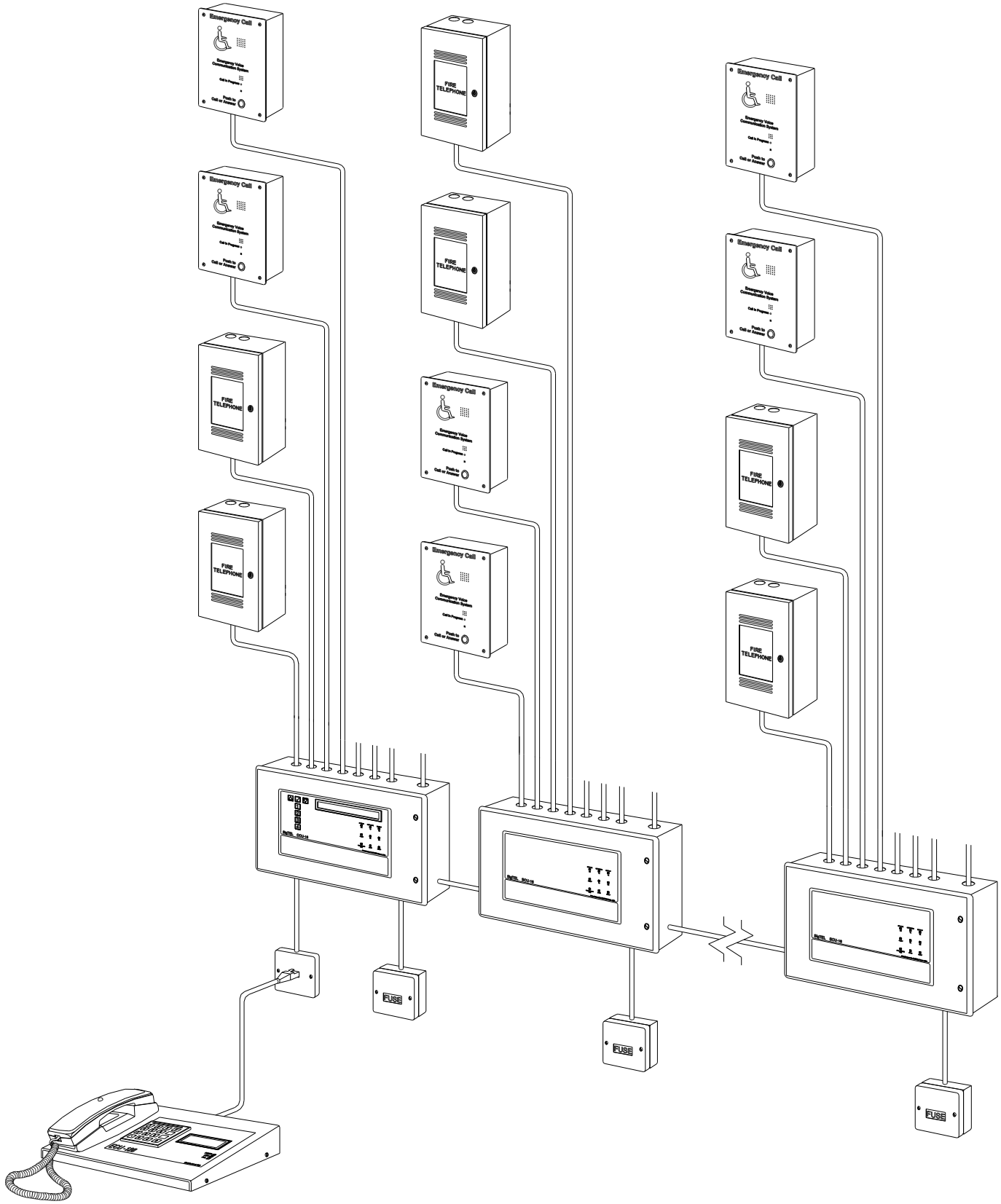
Emergency Call
FIRE TELEPHONE
FUSE

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1. IMPORTANT

READ THIS SECTION BEFORE INSTALLING / MAINTAINING THIS PRODUCT

This equipment must only be installed and maintained by a suitably skilled and technically competent person.

No responsibility can be accepted by the manufacturer or distributors of this product for any misinterpretation of an instruction, or guidance note, or for the compliance of the system as a whole.

EVC system design is beyond the scope of this document. An understanding of system components and their use is assumed.

About this guide

This guide explains how to install commission and maintain a SigTEL EVC disabled refuge and fire telephone system. A separate Operator Instruction (ref. DCP0001928) includes detailed operational information, some of which will need to be referred to by the installation engineer when setting up the system.

No responsibility can be accepted by the manufacturers or distributors for any misinterpretation of these instructions, or for the compliance of the system as a whole.

Note: This installation guide must not be accessible to the user.

System design

This document does not cover EVC system design. We recommend that you read BS 5839 Part 9 (available in libraries or from the BSI, www.bsonline.bsi-global.com) for this information.

Contact the building control or fire officer in case he has any special requirements.

Equipment guarantee

This equipment is not guaranteed unless the system is installed and commissioned in accordance with national standards by an approved and competent person or organisation.

General precautions

Do not test wiring with an insulation tester (Megger) with any equipment connected as the 500 volt test will destroy these devices totally.

You must observe local wiring regulations.

Do not run SELV and LV cables in the same enclosure without adequate insulation between them.

SigTEL EVC control equipment is designed to be installed indoors. Outstations are not IP rated so should not be installed outdoors unless an IP 65, or better housing is used and cables are installed so as to prevent the ingress of moisture.

Anti-static handling guidelines

Make sure that electro-static handling precautions are taken immediately before handling PCBs and other static-sensitive components.

Before handling any static-sensitive items, operators should get rid of any electrostatic charge by touching a sound safety earth.

Always handle PCBs by their sides and avoid touching any components.

PCBs should be stored in a clean, dry place that is free from vibration, dust and excessive heat.

Storing the PCBs in a suitable cardboard box will also guard them against mechanical damage.

2. Emergency Voice Communication (EVC) Systems

EVC systems are telephone, or intercom systems that are designed to operate reliably in a fire emergency. This means that the equipment and wiring is monitored for faults that might occur before the emergency and the cabling is designed to ensure that the equipment keeps working during an emergency.

There are two types of EVC systems; disabled refuge systems and fire telephone systems. They may be separate, or they may be combined into one system.

Disabled refuge system

A disabled refuge system connects hands-free outstations to a central control room and is used during a fire emergency to inform the management that someone needs immediate assistance to evacuate from the building.

Fire telephone system

A fire telephone system is used by management (and marshals at a sports ground) and the fire service before, during and after a fire to communicate with fire marshals and fire fighters.

Regulations affecting EVC systems

Disabled refuge systems are called for by DETR Approved document B (Fire safety) volume 2, section 4, Design for vertical escape and BS 5588 Fire precautions in the design, construction and use of buildings, Part 8, Code of practice for means of escape for disabled people.

Fire telephone systems for buildings are called for by BS 5588 Fire precautions in the design, construction and use of buildings Part 5, Code of practice for firefighting stairs and lifts, Part10, Code of practice for shopping complexes and Part 11, Code of practice for shops, offices, industrial, storage and other similar buildings.

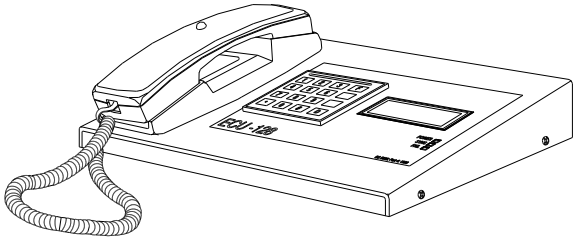
Fire telephone systems for sports venues are called for by the Guide to safety at sports grounds.

The installation of EVCs is covered by BS 5839-9 Fire detection and fire alarm systems for buildings – Part 9: Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems.

3. SigTEL Components

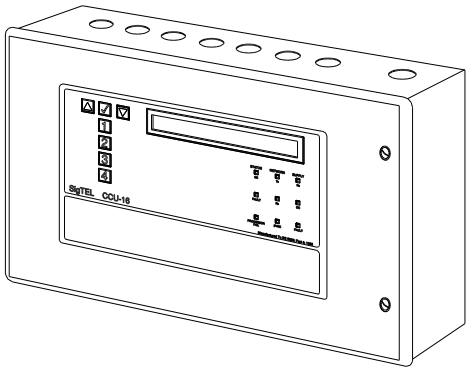
ECU-32/64/128 Desk control unit

This is the unit from which the operator communicates with the outstations (see right). It is available in three versions: ECU-32, which can control up to 32 lines; ECU-64, up to 64 lines; and ECU-128 for up to 128 lines.



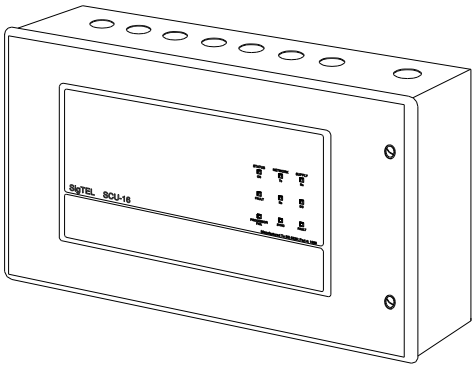
CCU-16 master EVC control unit

The CCU-16 is a 16-line telephone exchange and main controller (see right). It is supplied with a tone card that provides a ringing tone, a busy tone, an alert tone and an evacuate tone.



SCU-16 slave EVC expansion unit

The SCU-16 is a 16-line telephone exchange (see right). Up to seven SCU-16s can be connected to one CCU-16, giving a maximum system size of 128 lines.

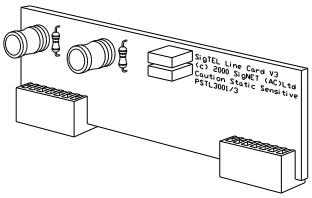


AFP385 grey flush bezel for CCU-16 and SCU-16

This flush bezel provides a neat finish when the CCU-16 or SCU-16 is semi-recessed (up to 60 mm).

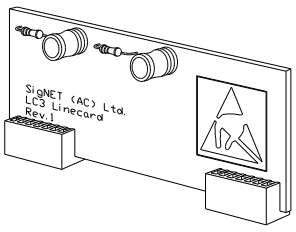
LC2 2-way Line Card for Type A outstations

Each CCU-16 or SCU-16 allows up to eight LC2 Line Cards (see right). Each LC2 enables two lines for Type A outstations (telephone handsets) to be connected to a CCU-16 or SCU-16. One Type A outstation can be connected per line.



LC3 2-way Line Card for Type B outstations

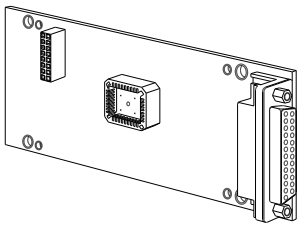
Each CCU-16 or SCU-16 allows up to eight LC3 Line Cards (see right). Each LC3 enables two lines for Type B outstations (hands free outstations) to be connected to a CCU-16 or SCU-16. One Type B outstation can be connected per line.



Note: Both LC2 and LC3 outstations can be used on the same system.

SVMM Message Card

An optional SVMM message module (see right) may be fitted to the CCU-16 to provide real speech for the same functions as the standard tone module.

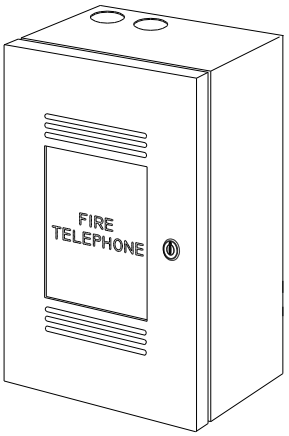


THS1-EMK4 Type A Fire Telephone Outstation with key lock

One Type A outstation (see right) is connected to each line so that the Control Room can call out to specific locations and also know which location is calling in.

The THS1-E, has a wall mounted key lockable red steel cabinet with all keys to pass (identical).

The housing has openings to allow the ringing to be heard, a fire retardant window with the legend “Fire Telephone” and may be surface mounted or semi-recessed.



THS1-ET/MK4 Type A Outstation with T-Bar handle

The THS1-ET has a wall-mounted non-locking T-Bar handle instead of a key lock.

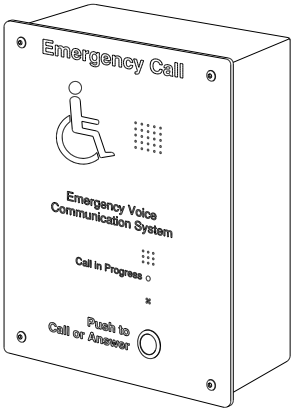
T-BEZ flush-mounting bezel

This flush bezel provides a neat finish when the THS1E or ET is semi-recessed.

EVC302S surface mounting Type B hands-free duplex EVC outstation

One Type B outstation is connected to each line so that the Control Room can call out to specific locations and also know which location is calling in.

The EVC302S has a stainless steel front plate with push-to-call or answer button, ringing LED and buzzer and apertures for a microphone and loudspeaker.



EVC302F flush mounting Type B hands-free duplex EVC outstation

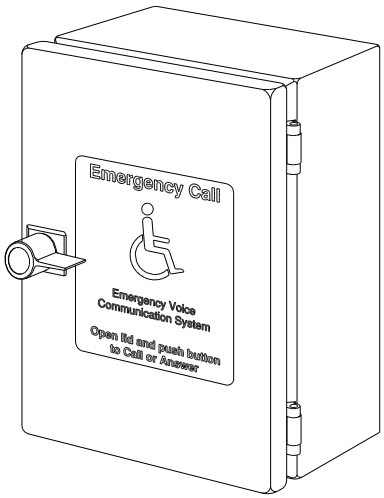
Similar to the S version but with a flat front plate suitable for flush installation (see right).

An IP66 rated housing (BF359/1), is available to allow the EVC302F to be used outdoors (see below).

BF359/1 IP66 Type B Outstation Box

The EVC302W is used to protect an EVC302F outstation when used as an external disabled refuge. It is supplied with a non-locking handle as disabled refuge points should not normally be locked.

Note: The EVC302S will not fit inside this box.



EVC302WL

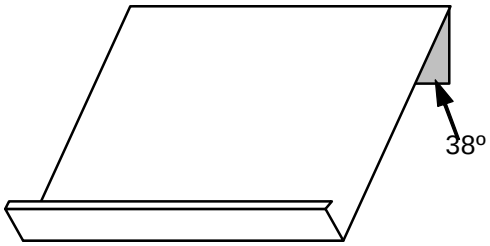
Locking handle for use with EVC302W.

Note: This part is only used in special circumstances.

ECU-WMB wall mount bracket

The ECU is intended to be free-standing. However, a sloping wall mounting shelf, ECU-WMB is available.

The ECU-WMB is finished in semi-gloss black powder coating and is angled at 38 degrees.



4. Cables

Cables used between EVC components should have enhanced fire resistance [see 26.2e of BS 5839-1:2002], except for underground sections of cabling at sports and similar venues.

See BS 5839-9:2003 section 14 for details.

Outstation lines

2-cores are required for each line and they should use 1 mm^2 or 1.5 mm^2 enhanced cable. Larger cables will stress the connectors.

The maximum cable resistance is 40 ohms, which is 1000 metres of 1 mm^2. If this exceeded, outstations may not work properly.

CCU-16 to SCU-16, SCU-16 to SCU-16

The maximum length of cable between any two exchanges is 200 metres.

HOWEVER, the maximum length of cable between the CCU and the last SCU is 800 metres.

Therefore if three units are each 200 metres apart, the remaining units must be connected on no more than 200 metres.

ECU-16 to CCU

These should be connected using fire-rated cable up to 200 metres.

The ECU-16 should be installed in a control room and the supplied 5 metre Cat-5 lead used to connect to an adjacent Cat-5 socket and with mechanical protection in accordance with BS 5839-1:2002.

5. Typical Systems

System up to 4 lines (see right)

Equipment required

One ECU-32 master exchange
Optional Cat 5 wall socket and back box
One CCU-16 slave exchange
Two 12 volt 7 Ah batteries
One 3 A fused spur and back box
One LC2 per two lines of Type A outstations
One LC3 per two lines of Type B outstations
One THS1-E Type A or EVC302 Type B outstation per line
One FiTT Telephone Line Tester

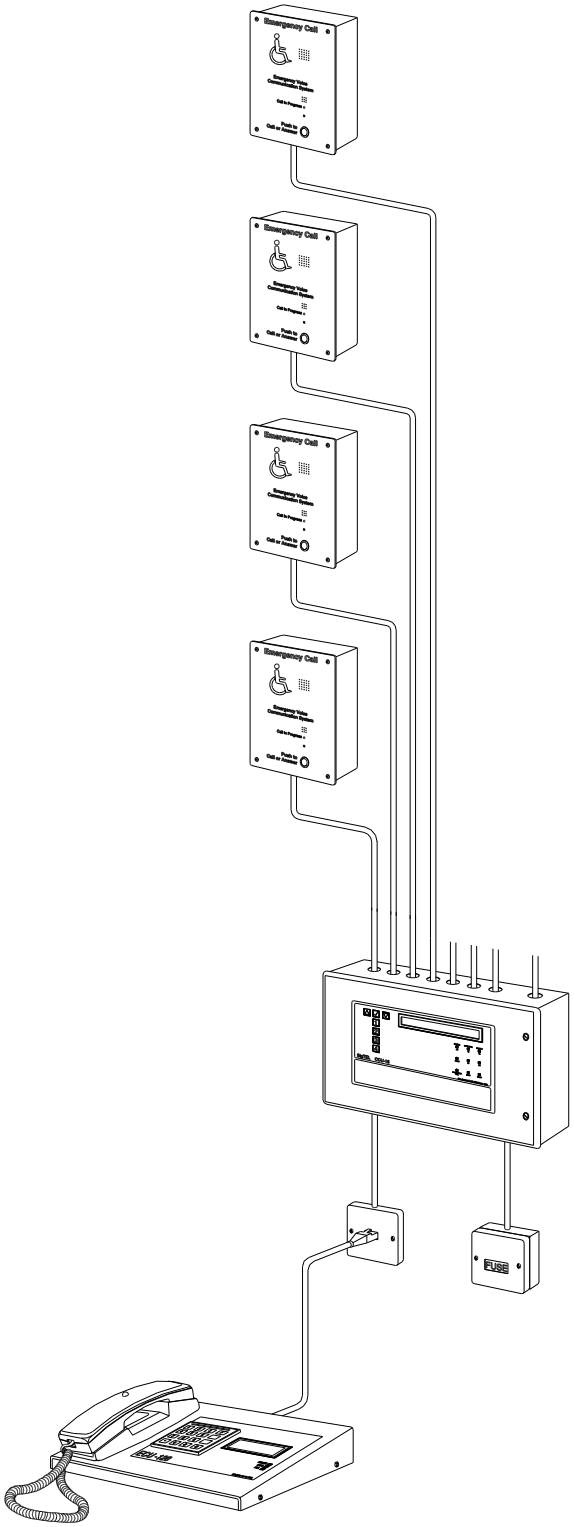
Interconnections

For each phone line, up to 1 km of 2-core 1.5 mm^2 enhanced fire-rated cable.

Between the CCU-16 and the ECU-32; two 4-core 1.5 mm^2 fire-rated cables up to 200 metres.

Note: If an odd number of outstations are required, there is no need to connect anything to the unused terminals.

When the system is configured an outstation will not be found and so a fault will not be reported.



System up to 128 lines (see below right)

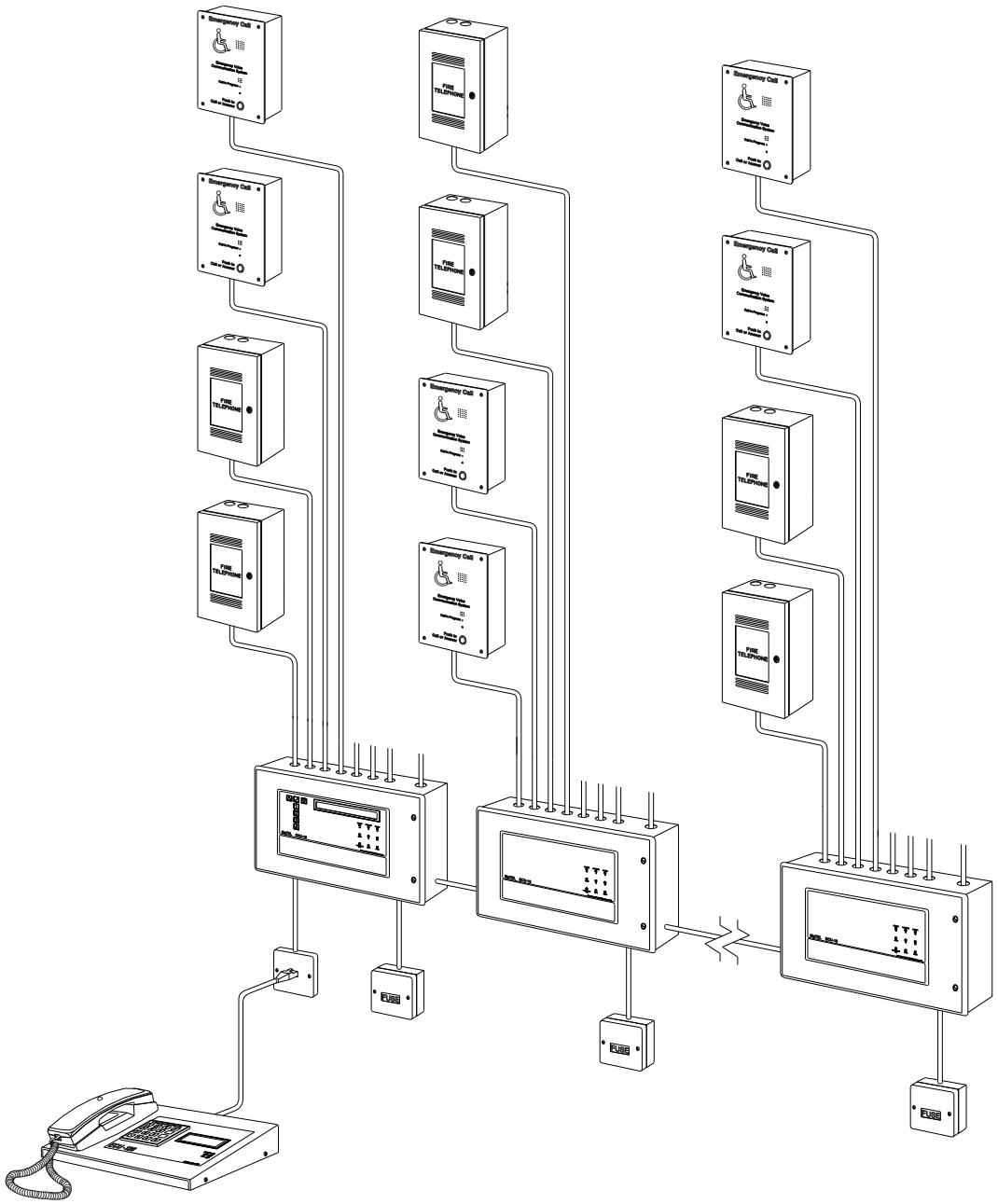
Equipment required

One ECU-32, 64 or 128 dial unit
One CCU-16 Exchange
Two 12 volt 7 Ah batteries per CCU & SCU
One LC2 per two lines for Type A outstations
One THS1-E Type A or EVC302 Type B outstations per line
Cat 5 wall socket and back box
Up to seven SCU-16s
One 3 A fused spur and back box per CCU & SCU
One LC3 per two lines for Type B outstations
One FiTT Telephone Line Tester

Interconnections

For each phone line, 2-core 1.0 mm^2 or 1.5 mm^2 enhanced fire-rated cable, up to 1000 m each.

Between the CCU-16 and the ECU, two 4-core 1.5 mm^2 fire-rated cables.



6. First Fix Installation

Equipment Location

Control equipment

Unless protected from the elements, all equipment must be sited indoors and MUST NOT be subjected to conditions likely to affect its performance, such as damp, salt air, water, extreme temperatures, physical abuse, etc.

The ECU, CCU and SCUs should be located in areas of low fire risk, usually in the control room.

The CCU / SCUs are wall-mounted and the ECU is normally free-standing on the control console.

Wall-mounted equipment should be sited at an easily accessible height, with the LCD at eye level, typically 1.4 metres above final floor level.

The interconnecting cable from the ECU to the CCU-16 is fully monitored and a fault will sound at the CCU if it is removed or damaged.

Outstations

Type A outstations should be located at entrances and fire fighting lobbies and should normally be mounted 1.3 m to 1.4 m from the ground.

Type B outstations should be located in disabled refuges at each storey exit and should normally be mounted 0.9 m to 1.2 m from the ground.

Outdoor installations

Outstations may be mounted in an IP 65, or better box, with an easily opened door. Steps should be taken to ensure that moisture does not enter and damage the electronics.

Sports stadiums

In sports stadiums, Type A outstations should be located no more than 30 metres from stewards' positions or other normally manned areas as listed in the Guide to Safety in Sports Grounds. If they are exposed to the elements they should be mounted in an IP 65 or better box with an easily opened door. Steps should be taken to ensure that moisture does not enter and damage the electronics.

Strobe driver module

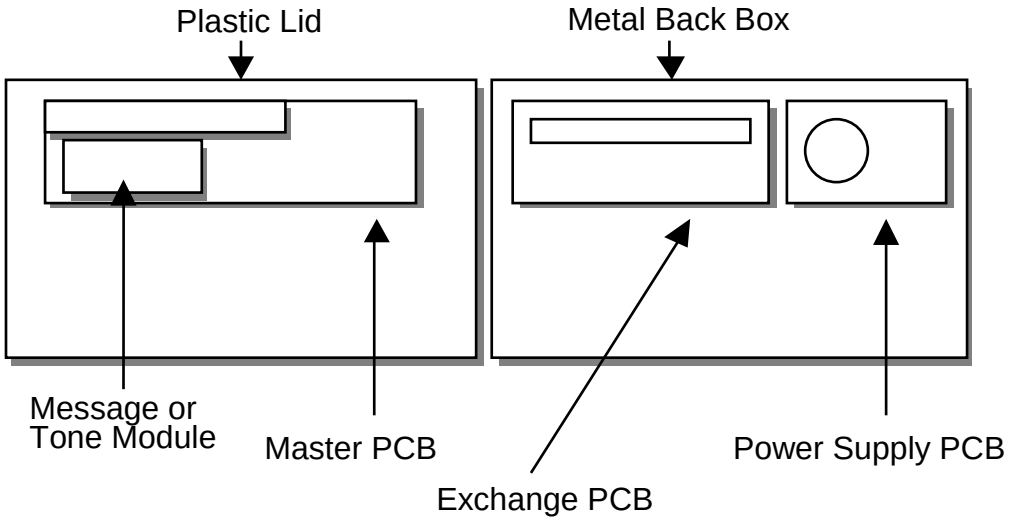
If the ringer is not loud enough a flashing red strobe light and / or sounder may be fitted to any Type A and Type B outstation.

A strobe driver module, SDM, which can switch up to one amp, should be connected across the line to sense when the outstation rings.

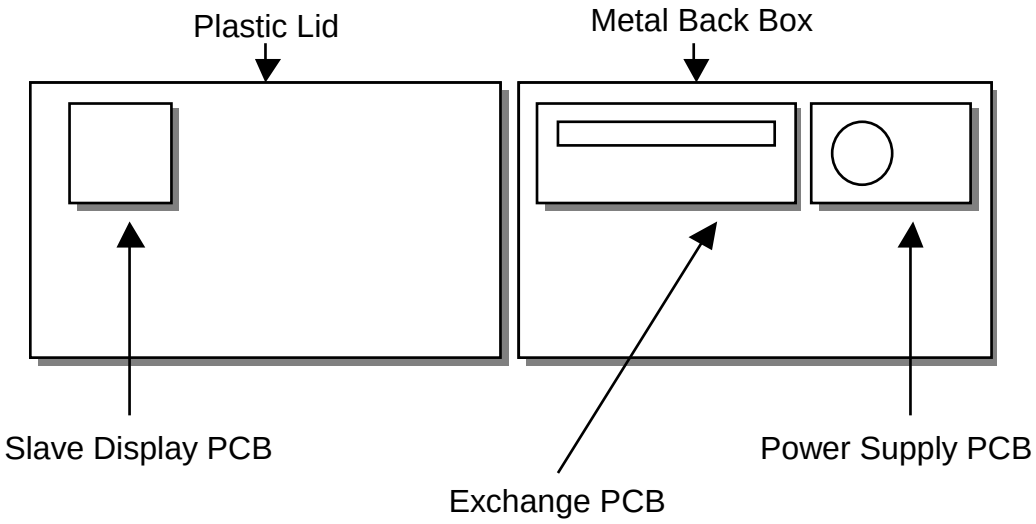
An external 12 VDC power supply must be connected to the strobe module to provide power for the module and/or sounder. This may be provided local to the outstation or centrally, in which case two extra cores will be required and voltage drop should be taken into account.

7. Mounting CCU-16 and SCU-16 Enclosures

The Central Control Unit (CCU-16) and Slave Control Unit (SCU-16) are supplied in a metal back-box with a hinged plastic lid and several printed circuit boards (PCBs), as shown below.



CCU-16 Central Control Unit



SCU-16 Slave Control Unit

The CCU-16 and SCU-16 can be surface or semi-flush mounted to allow clearance for front panel opening (max depth 60 mm including dimples). To expose the base mounting holes and to protect the hinged lid and PCBs from damage during installation, they must first be removed. Before any of the following is carried out ensure that the mains power supply is isolated and the batteries are removed.

Remove the lid

Take the panel out of its box and undo the two screws on the right hand side of the lid using a 3 mm Allen key.

Hinge the lid 180° to the left. Unplug the lid/base connecting cable from the Exchange PCB (20-way boxed header). Carefully remove the four M4 retaining nuts that secure the hinges.

Remove the base PCBs

Carefully remove all line cards from the Exchange PCB using correct anti-static handling procedures and store them in anti-static bags.

Disconnect the cable from the PSU to the Exchange PCB.

Disconnect the earth strap spade connector from the main chassis earth point.

Carefully remove the PCB retaining screw located at the bottom left hand side of the relevant PCB.

Push the PCB upwards and then pull forwards over the mounting pillars taking care not to damage any of the components.

The panel lid and base PCBs should now be removed from site to prevent accidental damage.

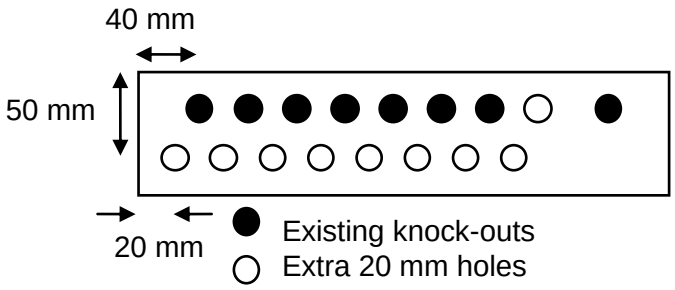
Note: All PCBs are static sensitive and anti-static handling precautions MUST be observed when handling them.

Remove knockouts & cut gland holes

Decide how the wiring will be brought into the panel and remove the knock-outs required for cable entry. Use suitable cable glands and securely blank off unused knock-outs.

If more than six lines are to be brought into a CCU-16 or SCU-16, a separate 20 mm hole must be cut for each extra line. See diagram for suggested locations for the holes.

Note: This must be done before re-installation of circuit boards to avoid swarf getting into the electronics.



Interconnections

Cable glands are provided in the bottom left hand side of the base to allow the units to be connected with fire-rated cables.

Fix the base to the wall

Using the four mounting holes, fix the base securely to the wall using a suitable screw fixing. The mounting holes are designed for No. 8 round-head or countersunk wood-screws. Any dust or swarf must be kept out of the enclosure and great care must be taken not to damage the wiring or components.

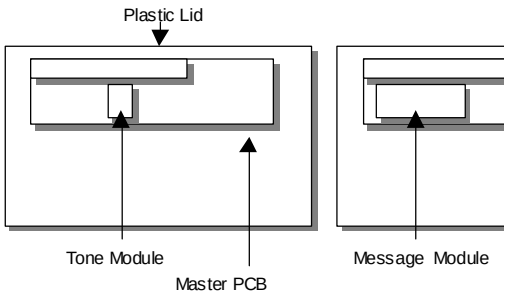
Re-install the PCBs

Re-install the base PCBs, with the exception of the line-cards, and refit the lid. Ensure the fixing screws and all interconnection cables are refitted correctly.

Install the optional SVMM message module

If an SVMM message module is required, identify the existing tone module on the plastic lid of the CCU-16, undo the two screws on the right of the tone module and gently pull it off the Master PCB.

Carefully locate the plug on the underside of the SVMM in the socket of the Master PCB and push it on. If the fixing screw holes are not correctly aligned, the plug is not fitted correctly. Fix the SVMM fixing screws to the mounting pillars.



8. Mains Wiring

Connect mains to the CCU and SCUs

See BS 5839-9 2003 section 13.

Each exchange requires fixed wiring using 3-core cable (no less than 0.75 mm^2 and no more than 2.5 mm^2) fed from an isolating un-switched fused spur, fused at 3 amps and must not be connected using a plug and socket. The 230 VAC cable MUST enter the enclosure via one of the inlets at the top right hand corner of the enclosure.

Ensure that mains cables are kept as far away as possible from all other cables.

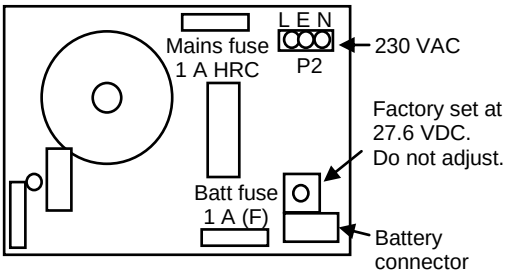
The mains supply should be exclusive to the EVC system. Circuit breakers supplying power to the system should be marked “EMERGENCY VOICE COMMUNICATION SYSTEM - DO NOT SWITCH OFF”.

A separate fused spur should be used for the CCU-16 and each SCU-16 and should be marked “EMERGENCY VOICE COMMUNICATION SYSTEM - DO NOT SWITCH OFF”.
See BS 5839-9 section 13.2 for more details

Terminate the mains input lead using the three-way plug supplied with the power supply PCB and ensure that correct polarity is observed.

The incoming mains earth connection must be connected directly to the three-way plug (P2) and NOT to the main chassis earth-point.

The Power Supply Unit (PSU) earth strap must be connected to the main chassis earth point before operation.



9. Fitting Outstations

Cables

Use 2-core enhanced fire-resistant cable for each outstation line, conductor size 1 mm^2 to 1.5 mm^2. Maximum recommended cable distance is 1 km, beyond which audio quality will degrade.

Maximum cable resistance before the outstations will not ring reliably and the fault monitoring system will not work is 40 ohms.

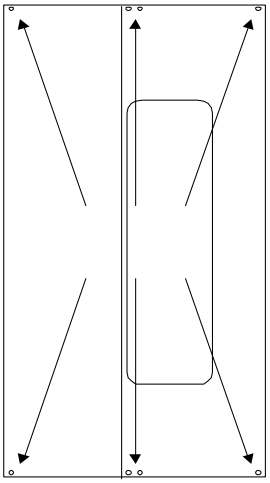
General

Type A outstations should normally be mounted 1.3 m to 1.4 m above final floor level and Type B should normally be mounted 0.9 m to 1.2 m above final floor level in an easily accessible, well illuminated and conspicuous position free from obstruction.

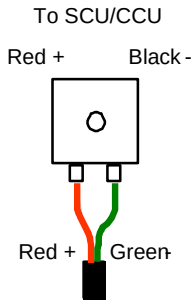
As far as practicable, outstations should be located where background noise is normally low (preferably not more than 40 dBA). Where there is a higher level of background noise the installation of an acoustic hood around the outstation might help to reduce the effect of background noise to an acceptable level.

Fitting the THS1-E or THS 1-ET Type A Outstation (Telephone)

Open the case and unscrew the eight cross-head screws to remove the internal cover (see right). This reveals the terminals and earth stud. Fix to the wall, remove the knock out above the terminals and fit a suitable cable gland.



Connect the wires, as shown right



Fitting Type B outstation (Hands free)

EVC302S - Surface mounting.

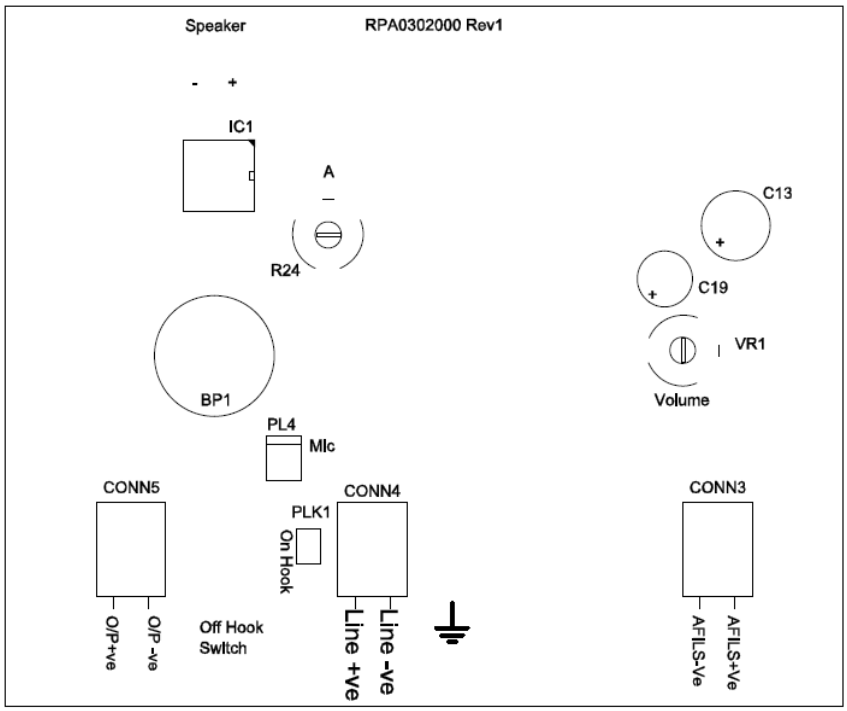
EVC302F - Flush mounting.

Both units are supplied complete with a back box that should be fitted to the wall using suitable fasteners. The back box has 20 mm knock-outs at the top and bottom. Gland the cable correctly and connect a sleeved earth wire to the earth stud.

Connect the line to the LINE IN + and – terminals.

When installation is complete, secure the lid using the four machine screws. These have a secure pin-hex design that requires a special Allen key (supplied).

Connections



SW OUT LINE IN EARTH AUDIO OUT

Connecting to an induction loop system

If an audio induction loop facility is required, the AUDIO OUT terminals should be connected to a line-level input of a suitable induction loop amplifier and an induction loop should be located adjacent to the outstation so that it covers the immediate area of the outstation adequately.

Connecting to a CCTV camera

When the outstation is active the opto-isolated SW OUT terminals close and can be used to trigger a CCTV camera or recorder. The maximum current they can pass is 3 mA at 24 VDC.

If this current is exceeded, the output will be damaged.

If required, an RLPV relay and a 24 VDC power supply can be used to give two sets of volt-free change-over contacts.

10. Second Fix Installation

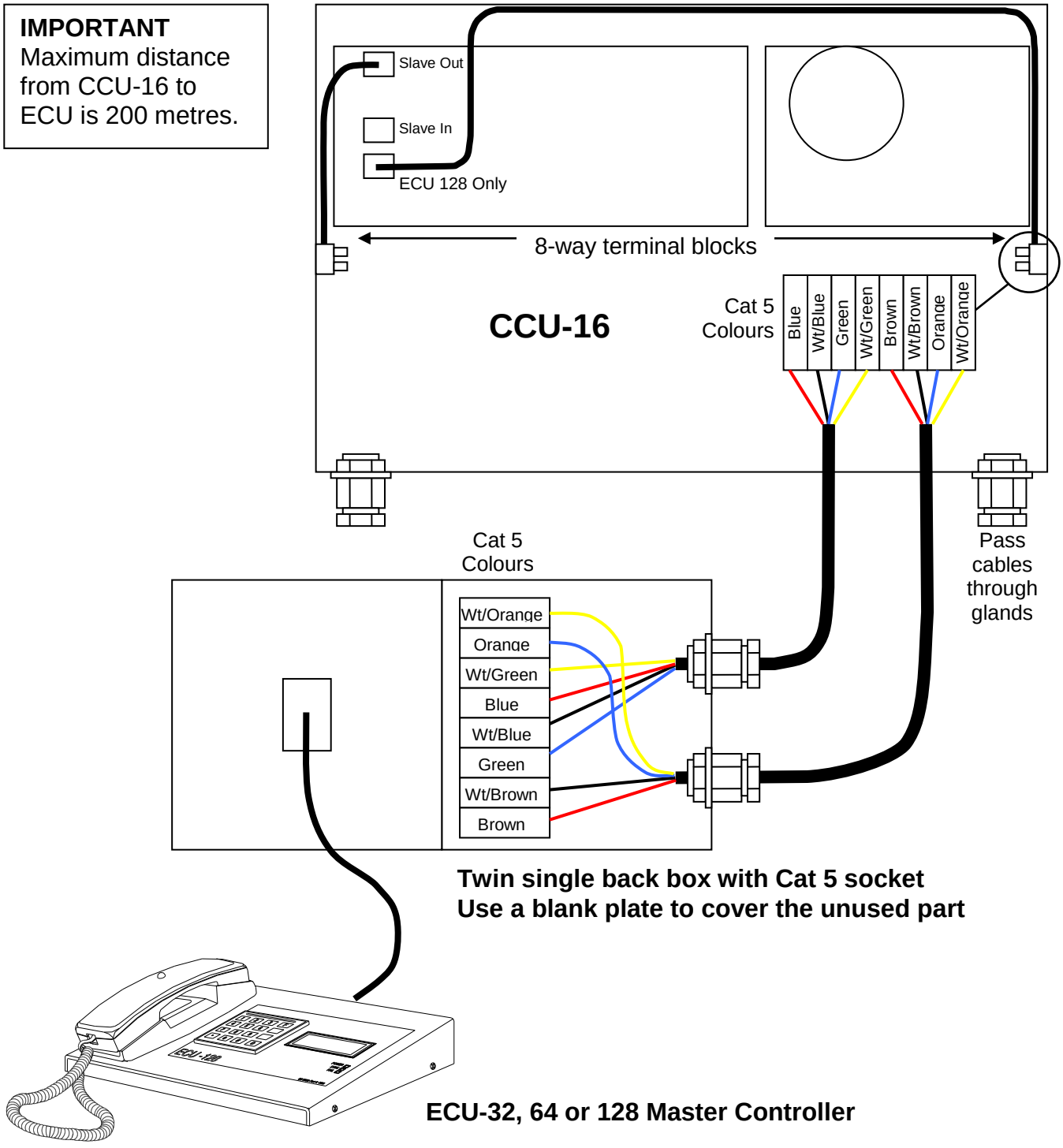
CCU-16 Master Exchange to ECU-32, 64 or 128 Master Controller

Cut off the release tabs and plug the supplied Cat 5 lead into the back of the ECU. Mount a twin single back box in a suitable location near to the control location* and connect two 4-core fire-rated cables to the supplied CAT 5 faceplate, as shown below.

Use one 4-core for TX-, TX+, RX- and RX+ and one 4-core for +24V, GND, Audio + and Audio –.

Note: Do not mix audio and data in one fire-rated cable as there is no internal screening. The audio quality will be severely degraded and the system may not operate reliably.

IMPORTANT
Maximum distance from CCU-16 to ECU is 200 metres.



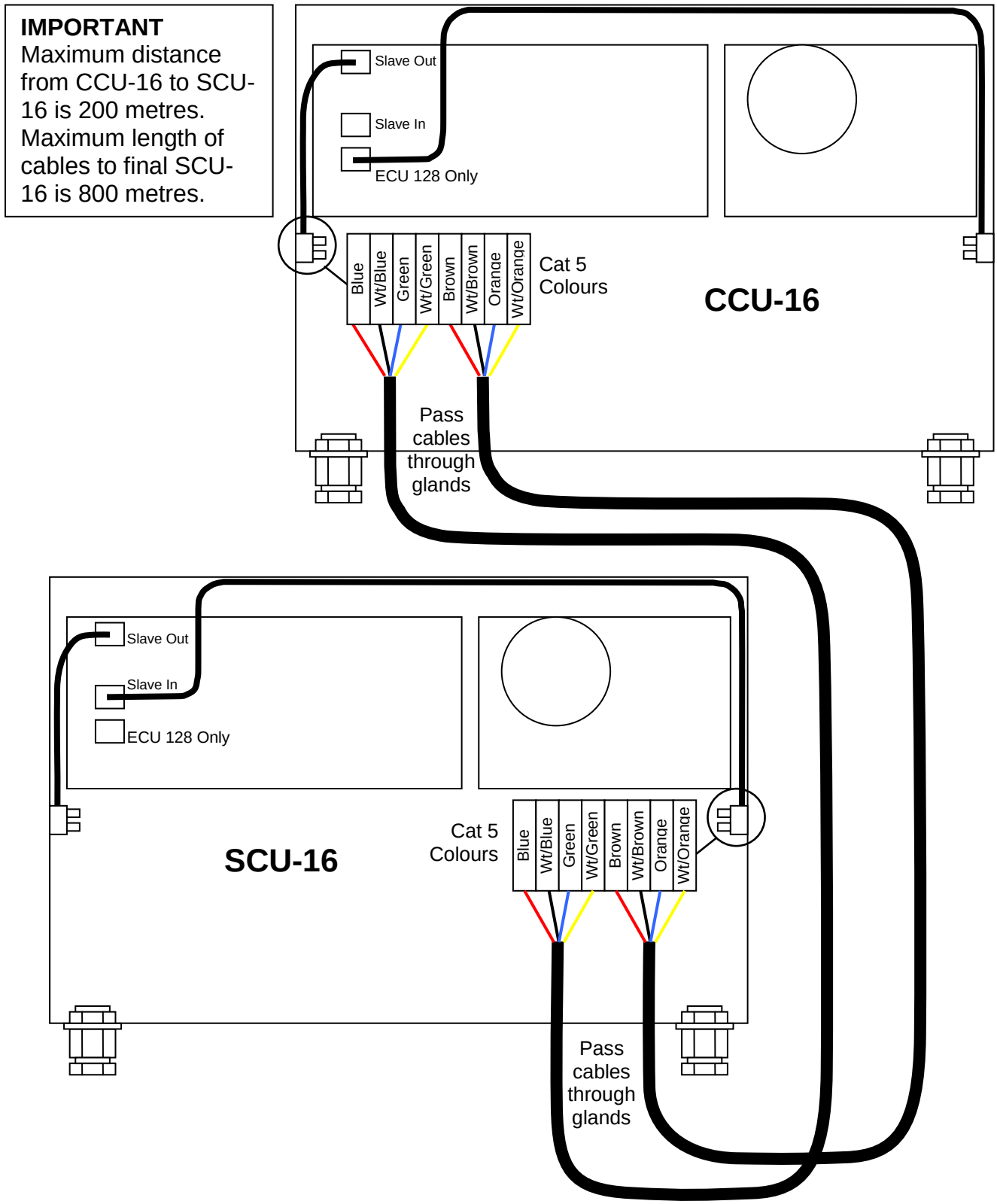
Twin single back box with Cat 5 socket
Use a blank plate to cover the unused part

ECU-32, 64 or 128 Master Controller

CCU-16 Master Exchange to SCU-16 Slave Exchange

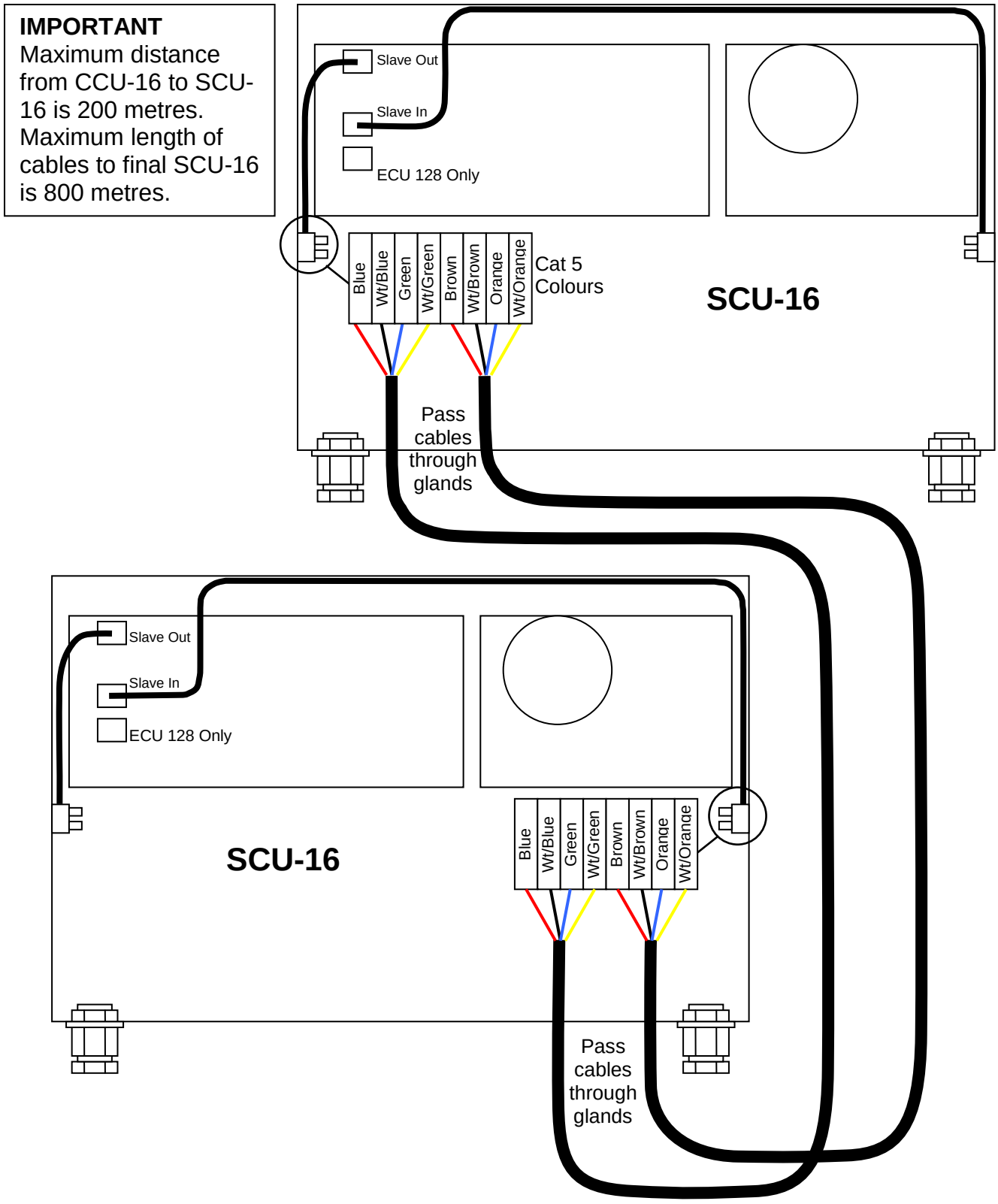
If the system has more than sixteen lines, one SCU-16 unit is required for every additional 16 lines to be connected, up to a maximum of seven SCUs and 128 lines.

IMPORTANT
Maximum distance from CCU-16 to SCU-16 is 200 metres.
Maximum length of cables to final SCU-16 is 800 metres.



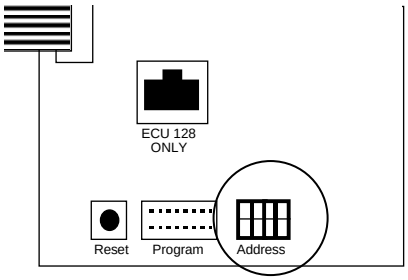
SCU-16 Slave Exchange to SCU-16 Slave Exchange

IMPORTANT
Maximum distance from CCU-16 to SCU-16 is 200 metres. Maximum length of cables to final SCU-16 is 800 metres.



Address the CCU and SCU-16

The CCU-16 and each SCU-16 must be given a unique address.



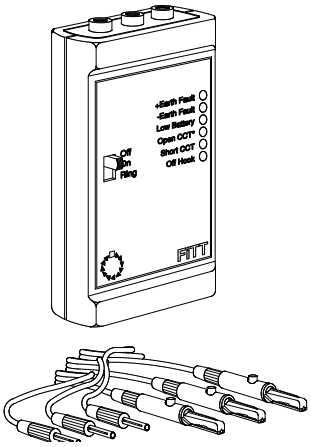
Addressing is done by setting the DIP switches, marked Address on the exchange PCB, as shown above.

11. Testing Outstation Lines

Insulation Resistance Testing

Insulation resistance testing should be carried out with no electronic devices attached. Any devices connected to the lines will be destroyed and will not be covered by factory warranty.

The FiTT Line Tester



Each outstation line should be tested prior to termination and connection to the exchange circuit board. We recommend that a SigTEL FiTT line tester (shown right) is used to save time proving the cables and outstations are working correctly.

It also avoids the need for mains power for testing.

If a FiTT line tester is not available, use a multi-meter to check wiring for continuity and correct polarity

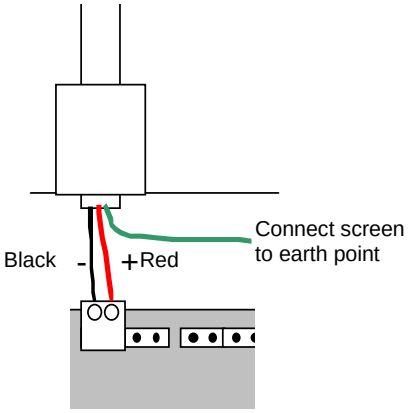
Connecting Outstation Lines

Do not connect the lines until they have been tested and are fault-free.

Connecting Lines to the CCU / SCU

Connect the wiring before fitting the line cards.

Each line should be brought into the enclosure through a separate cable gland. If more than six lines are connected, a separate 20 mm hole must be cut for each gland prior to re-installation of the circuit boards.



Connect the red and black cores of the field wiring, as shown right. Insulate the cable earth screens and connect them to the earth stud.

Fit the two-way connectors to pins L1 to L16. If both lines on the line card are used, fit the connectors together to form a 4-way plug before they are attached.

Fault Monitoring

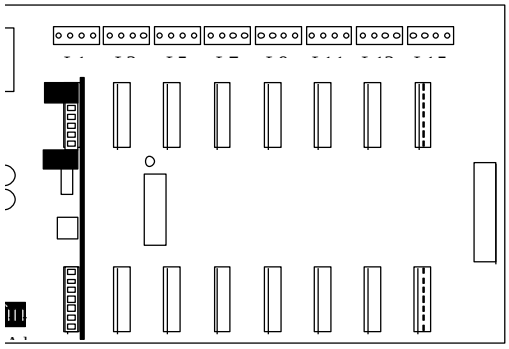
Once connected, the line fault monitoring system monitors for open and short circuits (absence of a device constitutes open circuit).

Fit the Line cards

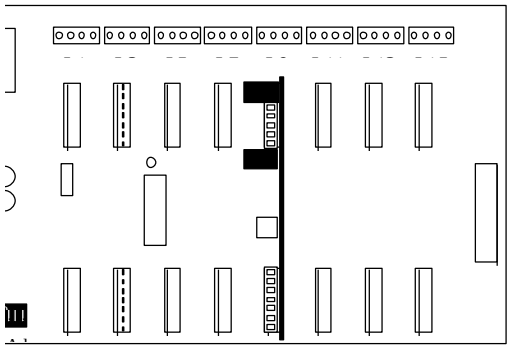
A line card (LC2 or LC3) must be fitted for every two lines used.

For example: If two lines are connected, terminals L1 and L2, fit a line card, as shown below.

Note: The LC2 line card can only be connected to Type A outstations. The LC3 line card can only be connected to Type B outstations.



If one line is connected, e.g. to terminals L9 and L10, fit a line card as shown below.



Fit the LC2 or LC3 Line cards

Grasp the line card at each end with the surface-mount components facing to the right. Identify the two connectors and locate them over the relevant connectors on the exchange circuit board, taking care that all the pins are mated correctly. Push the line card firmly on to the pins.

Notes:

1. Where a line card is fitted but a line is unused, e.g. for future expansion, no connections need be made to the terminals.
2. Where no line card is fitted, no connections need be made to the terminals.

12.Powering Up and Testing

Testing using batteries

Note: If mains supply is not present for commissioning, use fully charged batteries.

The system can be set up using batteries only provided their terminal voltage is at least 22 VDC.

Two 12 volt 7 Ah VRLA batteries should be used for the CCU-16 and each SCU-16. These should be connected in SERIES using the link provided with each unit.

Do not leave batteries attached whilst the mains is not connected or is subject to disruption as the batteries will become fully discharged and will have to be replaced.

Testing using mains

Fit the 3 amp fuses into the un-switched fused spurs.

Turning the power on

As soon as the CCU-16 receives power, the handsets will ring for a moment and the CCU-16 may sound a continuous fault buzzer. This is normal and will clear once the system has been configured.

As soon as power is applied, the system looks at each line card that has been fitted and configured and tests the lines for a correctly connected outstation. If any outstations have not been fitted, or are incorrectly connected, they will show up as faults straight away.

Check the LCD on the CCU-16

The LCD will display a message similar to the following, where 'N' can be any number.

```
N faults logged; N current (*)      Day
1* : Extension N Hand Set Open Cct.
```

The second line of the display will scroll and show all the faults in turn. If the system is being tested on mains only, one message will be 'Exchange 1 Battery Failure'.

If the system is being tested on batteries, one message will be 'Exchange 1 Power Fail'.

Temporarily silencing the fault buzzer

If you wish to mute the fault buzzer, go the CCU-16 and enter the default code 144111.

This PIN can be changed if required. See page 24 for details.

As soon as you press the first '1' the display changes and the top line displays the following:

```
Enter PIN  : #*****
1* : Extension N Hand Set Open Cct.
```

As you enter the other numbers, the * symbols change to # symbols.

As soon as the PIN is correctly entered, the fault buzzer stops and the display reverts.

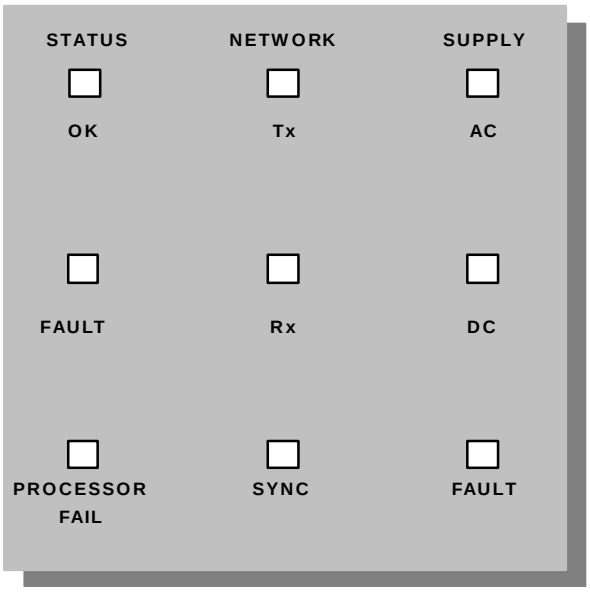
If you enter the wrong PIN the display shows the following:

```
Wrong PIN
1* : Extension N Hand Set Open Cct.
```

Check the CCU-16 Indicators

The exact indication will depend on the nature of the faults found on switch-on.

Typical Indications



STATUS column

OK	Off
FAULT	Yellow
PROCESSOR FAIL	Off

If processor fail is lit, there is a serious problem with the microprocessor on that unit.

NETWORK column

Tx	Dim flickering green
Rx	Dim flickering green
SYNC	Off

If the yellow SYNC LED is lit, there is a problem with the data communications between the CCU-16 and the SCU-16(s).

SUPPLY column

AC	Green if mains connected, off if not
DC	Green if batteries connected, off if not
FAULT	Yellow if either mains or batteries are not connected

Check the ECU is working

The green power LED should be lit.

The display should be lit and display the software code version ‘SigTEL Dial Vx.x.x’.

Check all outstations are working.

Go to each outstation in turn and try to make a call. If you hear ringing tone, it is OK. If not, check for correct polarity, or cable faults.

When you are satisfied that all the outstations are connected, you can begin the system configuration.

Fit the Batteries

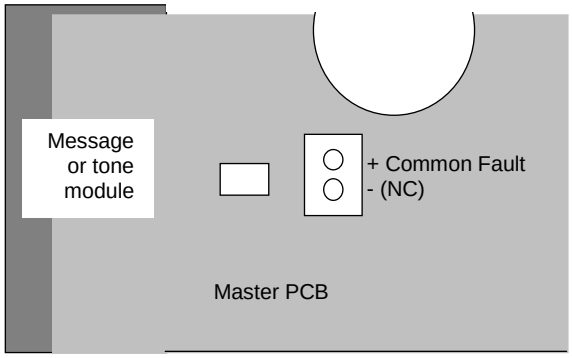
Once the system is OK, fit the batteries (2 x 12 V 7 Ah VRLA) for the CCU-16 and each SCU-16. Use the links provided to connect the batteries in series.

13. Optional Interfaces

Fault output to fire alarm system

If the CCU is installed away from the control room, the fault buzzer may not be heard so the common fault output can be connected to a fire alarm system.

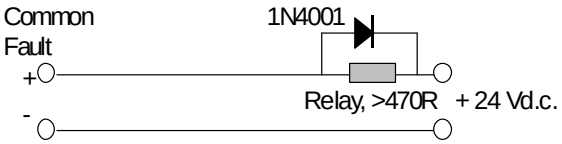
This output is an open collector with a maximum current capability of 50 mA.



Connection to a relay

The fault output can switch a 24 volt relay with a coil resistance of not less than 470 ohms.

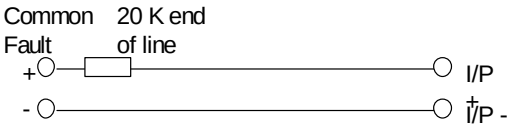
Connect as shown below and make sure a 1N4001 diode is connected across the coil to protect the output from back-e.m.f. The relay will be normally energised and will release when a fault occurs.



Connection to a fire alarm

The fault output can be connected to a fire alarm via an input unit connected to a detection loop.

The following details are for the Apollo XP95 Input/Output Unit.



The 20 kohm resistor supplied with the unit should be connected at the CCU-16. When a fault occurs the fault output goes open circuit.

The unit sees this as a fault and passes this information to the fire alarm panel, which should be configured to display it as a fire telephone fault.

Triggering from a fire detection system

This feature is normally used in conjunction with a SVMM message storage unit.

When triggered, all phones ring. When they are picked up, an ‘alert’ or ‘evacuate’ message (or tone if the tone module is fitted) will be heard.

If both messages are triggered, the evacuate message will be heard. The messages continue to play until cancelled by a reset signal.

Audio from a PA or VA system

A line level audio output from a PA / VA system can be connected, along with a trigger connection. When the trigger connection is closed, all phones ring and the audio from the PA may be heard at all handsets. This takes priority over the recorded messages (if fitted).

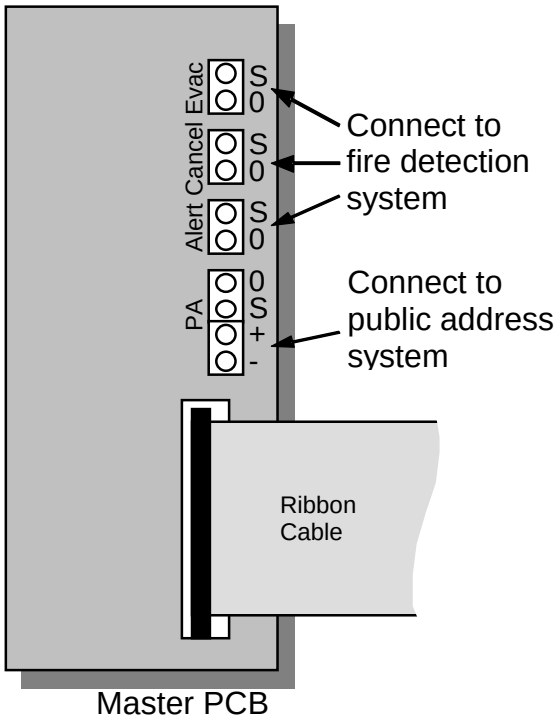
Important

To make sure that the fire telephone will be operational when needed it should only be able to be triggered when the control room is unmanned.

If any input is asserted, the fire telephone can still be used from the control room which will have priority over all other messages or tones.

However, when a handset is picked up, a call will not be made to the control room, instead, the emergency message will be heard.

Connections



PA

PA+, PA- Unbalanced line audio input

S, 0 Close a switch between S and 0 and audio from the PA system will be routed to all telephones.

Evac

S,0 Close a switch between S and 0 to play the evacuation tone or message to all telephones. Continues until cancelled.

Alert

S,0 Close a switch between S and 0 to play the alert tone or message to all telephones. Continues until cancelled.

Cancel

To cancel the Evacuate and Alert tones or messages, remove the triggers and then close a switch across S and 0.

Messages will stop immediately and not play to the end.

14.CCU-16 Error Codes

The CCU-16 display has two lines. If there are no faults, the first line shows the current software version. If there are faults, the message depends on the current mode and whether anyone is logged in.

Latching fault display mode

This is the normal mode. If no-one is logged in, the top line displays information in the format:

'x faults logged; y current (*)' where x and y are any number

Or, if someone is logged in, the format will be:

'x faults logged; y current (*). √ = Accept'

The second line gives details of the fault in text.

Non-latching fault display mode

This mode is used during commissioning to prevent temporary faults appearing to be permanent. The system should not be left in this mode after hand-over.

The top line displays information in the format:

'x faults logged'.

Fault Alarm Mute Mode

This mode is used to prevent the fault buzzer sounding during commissioning. The system should not be left in this mode after hand-over.

Default Fault messages

For the following messages, check the wiring between the CCU & SCUs:

Master Unit APB line open circuit

Master Unit APB line short circuit

Master Unit speech line open circuit
Master Unit speech line short circuit
Exchange X APB line open circuit
Exchange X APB line short circuit
Exchange X speech line open circuit
Exchange X speech line short circuit

The following show a fundamental problem with the unit. Check all connectors are firmly in place.

Master Unit Program Checksum Fail (CCU-16)
Master Unit EEPROM Checksum Fail (CCU-16)
Exchange X Program Checksum Fail (CCU-16 or SCU-16)
Exchange X EEPROM Checksum Fail (CCU-16 or SCU-16)
Exchange X Data Checksum Fail (CCU-16 or SCU-16)
Dial Unit X Program Checksum Fail (ECU)
Dial Unit X EEPROM Checksum Fail (ECU)
Dial Unit X Data Checksum Fail (ECU)
Exchange X Comms Time Out (SCU-16)
Dial Unit X Comms Time Out (ECU)
Exchange X Sync Error (s) (CCU-16 or SCU-16)
Dial Unit X Sync Error (s) (ECU)

Check the relevant telephone line.

Extension XX Hand Set Open Circuit
Extension XX Hand Set Short Circuit

Problem with the message store or tone module

Master Unit MP2 Fault

Problem with the mains or battery

Exchange X Power Fail
Exchange X Battery Fail

15.ECU & CCU-16 Keypads

Six keypad functions can be called up by pressing ‘F’ and a key 1 to 6. If the number key is not pressed within 2.5 seconds the F key must be pressed again.

F1, Auto Configure

This function looks at the linecards fitted to the system and searches for outstation extensions connected to them.

Enter the default PIN 2222 and the system will automatically configure.

Faults are not recorded during configuration.

F2 Directory Edit

Enters directory edit mode. PIN protected, default 2222.

F3 Latching/non-latching faults

Switches the fault-logging mode between latching and non-latching mode. PIN protected, default 2222.

F4 Change PINs

Press F followed by 4.

This allows PINs to be changed. PIN protected, default 2222.

All three PINs can be changed with this function.

After pressing the function key and 4, enter the edit PIN number, default 2222.

You are then given a sub menu with three options. The option you require may be selected by using the and ↑ and ↓ keys and the * key, or by keying in the option number.

After making the selection you will be asked to enter one of the following:

The Edit PIN

This is the PIN number for the ECU dial unit and is used in all editing.

It is 4 digits long (default 2222) and may contain any of the digits 0 - 9. It may not contain *, # or any of the special keys.

After entering the new PIN number, you will be asked to confirm selection by typing the number again.

If this PIN is lost, the ECU must be returned to the manufacturer to be reset.

This is chargeable.

The Fault Acknowledge PIN

This number is used on the CCU-16 Master Control to acknowledge faults.

It is a 6 digit number (default 222222) using only the digits 1 - 4. No other keys are allowed.

After entering the new PIN, you will be asked to confirm selection by entering it again.

If this number is lost, a new PIN can be entered without knowing the original.

The Mute PIN

This PIN disables or re-enables the fault buzzer on the CCU-16 unit.

It is a 6 digit number (default 144111) using only the digits 1 - 4. No other keys are allowed.

After entering the new PIN, you will be asked to confirm selection by typing the number again.

If this number is forgotten, a new PIN can be entered without knowing the original.

If you make this PIN the same as the Fault Acknowledge PIN, the MUTE function is disabled.

F6, Night Service Configuration

This is PIN protected (default 2222).

This is used to choose the night service extension.

The extension is selected from the directory using the ↑ ↓ and * keys.

F5, Night Service

In Day Mode, press F & 5 to select Night Service, press F & 5 again to switch back to Day Mode.

In Night Service the ECU keypad is disabled. Instead the selected outstation operates as a “receive any, broadcast to all” outstation.

If this extension is lifted, all other outstations except the ECU Dial Unit will ring and can hear the night service outstation but cannot speak to it.

If any other handset except the ECU 128 Dial Unit is lifted, it calls the night service handset. These two handsets can hold a two-way conversation. The handset is still monitored by the CCU-16 exchange, but otherwise the ECU is dormant.

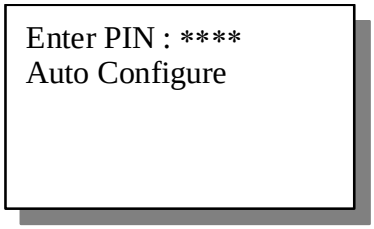
Note: Type B outstations (hands free outstation) must not be used as a night service master.

16. Automatic Configuration

Once you are satisfied that everything is functioning correctly, the system should be configured.

At the ECU Dial Unit and press F1.

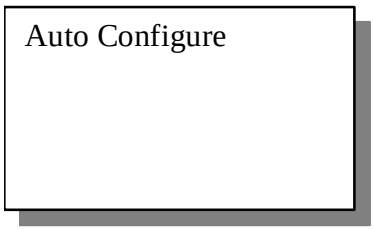
The display reads:



Enter the PIN, default 2222.

The ECU display reads as follows for five seconds whilst the system searches for all the phones.

At the same time, the CCU-16 display reads ‘Auto Config’ and the Tx and Rx lights flicker.



As set-up finishes, the PROCESSOR FAIL light comes on briefly.

Check Configuration

Each line card position has a unique extension number. The CCU contains lines 1 to 16; the first SCU contains lines 17 to 32, and so on.

When the system auto-configures, it looks at each line in turn and remembers the extensions it finds.

To check configuration, press D on the ECU. The display lists all the extensions found. Use ↑and ↓ to scroll through the list, which should be the same as the extensions numbers you expect. Any missing extensions should be investigated.

If the fault cannot be located, swap outstation lines and see if the fault stays or moves with the line. If it stays, it is an equipment fault; if it moves, it is a wiring fault or faulty outstation.

If it is an equipment fault, power down and swap the line card. If the fault moves with the line card, it is a line card fault. If it stays with the extension cable, it is a wiring or outstation fault so use the FiTT to test or try swapping the outstation.

17.Editing Outstation Names

Outstation names can be changed from the ECU Master Controller. The default name of an outstation is 'Extension' followed by the outstation number (two digits for outstations 1 - 99 and 3 digits for outstations 100 - 128).

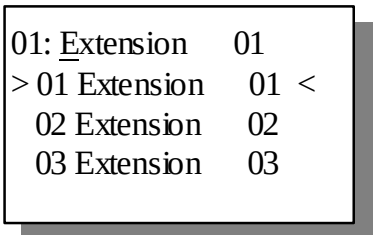
You should give meaningful names to outstations to enable the operator to see which is calling.

The directory can be used to select which outstation to call by name, without knowing the number.

In order to edit outstations press F2 at the ECU Master Controller, followed by the Edit PIN number, default 2222

You will see the following screen

To name an outstation, use ↑ and ↓ to highlight it thus > 01 Extension 01 <.



The first letter of the word Extension is flashing and underlined. This can be altered by using the keypad in a similar way to that used on mobile telephones.

The first press on a button selects one letter; further presses select the next letter as shown below.

Once you have selected the right letter, press * to accept. The flashing cursor will move to the right. If you want to go back, press #.

Note: When entering this mode, the last person you called or who called you is automatically displayed first, ready for editing. This is handy during installation. Get someone to walk the area and pick up each phone or press the button on the Type B (hands free) outstation in turn, saying where they are. Then go into edit mode and change the description. This also confirms the audio quality of the extension is satisfactory.

Special characters on the 0 key (< > and > <) allow characters to be inserted and deleted. These keys may be used repeatedly, and so they stay active until another key such as the # key is pressed.

If you accidentally start to change a letter you can cancel the change at any point before you accept (with the * key), by pressing #. This includes the insert and cancel keys described above.

This only works before * is pressed. It does not undo changes.

Storing the changes

Pressing the ↑ or ↓ key confirms the changes and you will see the new name at the bottom of the display. Further presses of the ↑ or ↓ key scroll the directory as normal. Until the ↑ or ↓ key is pressed, you can abort the change by pressing the Function key to leave edit mode.

You will then have to log in again before you can carry out any other changes.

Finishing

To return the keypad to normal operation and save all the changes permanently, press the Function key. This also causes checksums to be recalculated on the unit.

Important: if you power down before pressing the Function key, checksums will not be recalculated and a permanent fault will occur.

Characters associated with each key

Key	1st Press	2nd Press	3rd Press	4th Press	5th Press	6th Press	7th Press	8th Press	9th Press	10th Press
1	A	B	C	a	b	c	1	(	)	
2	D	E	F	d	e	f	2	[	]	
3	G	H	I	g	h	i	3	{	}	
4	J	K	L	j	k	l	4	<	>	^
5	M	N	O	m	n	o	5	@	#	!
6	P	Q	R	S	p	q	r	s	6	
7	T	U	V	t	u	v	7	/	\	|
8	W	X	Y	Z	w	x	y	z	8	
9	9	£	$	%	&	?	.	,	:	;
0		0	< > (Insert)	> < (Delete)	-	+	*	=	“	’
*	Make change									
#	Back-space									
↑	Accept*	Previous Extension								
↓	Accept *	Next Extension								

18. Component Specifications

Power Supplies

Mains and batteries must be connected to the CCU-16 and each SCU-16. Mains must be permanently connected and local wiring regulations must be followed. No other power connections are required.

External cabling

Outstation lines

2-core 1.0 mm^2 or 1.5 mm^2 enhanced fire-rated cable, up to 1 km per line.

CCU to SCU, SCU to SCU

Two 4-core 1.0 mm^2 or 1.5 mm^2 enhanced fire-rated, max 800 metres between CCU and last SCU. Max 200 metres between individual units.

ECU to CCU

Two 4-core 1.0 mm^2 or 1.5 mm^2 enhanced fire-rated cable, up to 200 metres. Do not use a larger multicore as audio and data must be separately screened.

CCU-16 Master control unit and SCU-16 Slave control unit

Base dimensions	412 mm W x 250 mm H x 80 mm D
Lid dimensions	435 mm W x 269 mm H x 11 mm D
Weight,	unpacked 3.1 Kg, packed 4.0 Kg

Power supply

Mains supply	230 VAC 50/60 Hz
Internal supply	27.6 VDC
Output current	1 amp max
Supply monitored for failure	Yes
Batteries monitored for failure	Yes
Quiescent current	<30 mA
Max current	< 50 mA

Fuses

Mains fuse	1 A (T) 20 mm HRC
Battery fuse	1 A (F) 20 mm

Batteries, per CCU-16 and SCU-16

Two 12 Volt 7 Ah

Each CCU & SCU needs a separate mains supply

Line specification

Max Number of lines per CCU / SCU-16	16
Number of outstations per line	1
Lines monitored for open circuit	Yes
Lines monitored for short circuit	Yes
Lines monitored for earth fault	Yes

Weight and dimensions

Part No.	Height (mm)	Width (mm)	Depth (mm)	Unpacked weight (kg)	Packed weight (kg)
CCU-16	270	435	85	3.1	4.0
SCU-16	270	435	85	3.1	4.0
ECU-32/64/128	100	305	230	1.7	3.0
THS1-E	350	200	105	3.8	4.5
THS1-ET	350	200	125	3.8	4.5
T-BEZ	395	242	6	0.27	0.3
EVC302F	250	160	53	1.4	1.4
EVC302S	240	175	53	1.4	1.4
FiTT	135	77	35	0.16	.25
SDM	60	48	30	0.003	0.005

Case colours

ECU-32/64/128	RAL 3000(red)
CCU & SCU	Fascia RAL XX (Light grey)
	Base RAL XX (Grey texture)
THS1-E	RAL 3000 (red)
EVC302F& S	Fascia Stainless steel
	Base RAL 9005 (Jet Black)

Audio section

Microphone frequency response	250 Hz to 5 kHz +/- 3 dB
Earpiece frequency response	250 Hz to 4 kHz +/- 3 dB
Loudspeaker frequency response	250 Hz to 4 kHz +/- 3 dB

19. Identification of SigTEL EVC components

SigTEL EVC is a development of the SigTEL fire telephone system.

Major changes are as follows:

1. Introduction of EVC320F and EVC302S Type B hands-free outstations.
2. Introduction of LC3 line card to allow connection of Type B outstations.
3. Revision of CCU-16 software to allow calls to Type B outstations to be cancelled.
4. Revision of ECU-16 software to allow calls to Type B outstations to be cancelled.

Items 1 and 2 are identified by part numbers on the circuit board.

Item 2 is identified by a yellow sticker on the exchange PCB with “Vxxxxxxx” and a yellow sticker on the control PCB in the door with “Vxxxxxx”.

Errors and omissions excepted. The manufacturer’s policy is one of continuous improvement and we reserve the right to alter product specifications at our discretion and without prior notice. E&OE.

20. Installation and Commissioning Certificate

Before the system and the user manual are handed over to the responsible person on site, the following certificate should be completed by the installer / commissioning engineer.

Certificate for the emergency voice communication system at:

Address:

I/we being the person(s) responsible (as indicated by my/our signatures below) for the supply, installation and commissioning of the EVC system, particulars of which are set out below, certify that the system complies to the best of my/our knowledge and belief with the recommendations of BS5839-9:2002, except for the variations, if any, stated in this certificate.

Name (in block letters): Position: …….

Signature: Date:

For and on behalf of:

Address:

Postcode:

The extent of liability of the signatory is limited to the system described below.

Variations (see BS5839-9, Clause 6): ……

☐ All equipment operates correctly.

The following documents have been provided to the purchaser or user:

☐ "As fitted" drawings.

☐ Operating and maintenance instructions.

☐ Sufficient representatives of the user have been properly instructed in the use of the system.

Maintenance

It is strongly recommended that, after completion, the system is tested, inspected and serviced in accordance with section 5 of BS5839-9:2003.

The user should appoint a responsible person to supervise all matters pertaining to the EVC system in accordance with the recommendations of section 6, BS 5839-9:2003.